

**AMENDMENT**

**Please change the title of the invention to read:**

--DUAL FUNCTION GLYCOPROTEIN HORMONE COMPOSITIONS--

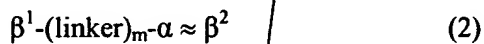
**In the Specification:**

On page 1, please delete lines 8-10.

**In the Claims:**

**Please replace the presently pending claims with the following claims:**

1. (Amended) A method to provide a subject with different glycoprotein hormone activities which method comprises administering to a subject in need of said activities a composition of the formula:



wherein each of  $\beta^1$  and  $\beta^2$  has the amino acid sequence of the  $\beta$  subunit of a vertebrate glycoprotein hormone, or a variant thereof;

" $\alpha$ " has the amino acid sequence of the  $\alpha$  subunit of a vertebrate glycoprotein hormone or a variant thereof;

"linker" is a linker moiety; and

" $\approx$ " is a noncovalent link between  $\alpha$  and  $\beta^2$ ;

m is 0 or 1;

wherein each of  $\beta^1$  and  $\beta^2$  confer a different activity on said composition, with the proviso that if  $\beta^1$  is CG $\beta$  then  $\beta^2$  is not FSH $\beta$ .

2. (Amended) The method of claim 1 wherein  $\beta^1$  and  $\beta^2$  are native  $\beta$  subunits.

3. The method of claim 1 wherein  $\beta^1$  and  $\beta^2$  exhibit different biological half-lives.

5. The method of claim 1 wherein said subject is in need of enhanced fertility.

25

B2  
Sub C3

6. (Amended) The method of claim 5 wherein  
both  $\beta^1$  and  $\beta^2$  confer FSH agonist activity on said composition; or  
both  $\beta^1$  and  $\beta^2$  confer CG agonist activity; or  
both  $\beta^1$  and  $\beta^2$  confer LH antagonist activity; or  
one of  $\beta^1$  and  $\beta^2$  confers FSH agonist activity and the other confers LH antagonist  
activity or lowered LH agonist activity; or  
one of  $\beta^1$  and  $\beta^2$  confers FSH agonist activity and the other confers CG agonist activity;  
or  
one of  $\beta^1$  and  $\beta^2$  confers LH antagonist activity or lowered LH agonist activity and the  
other confers CG agonist activity.

10. (Amended) The method of claim 9 wherein  
one of  $\beta^1$  and  $\beta^2$  confers FSH agonist activity and the other confers LH antagonist  
activity or lowered LH agonist activity on said composition; or  
both  $\beta^1$  and  $\beta^2$  confer FSH agonist activity; or  
both  $\beta^1$  and  $\beta^2$  confer LH antagonist activity.

B3  
Sub C5

11. (Amended) A glycosylated or nonglycosylated composition of the formula  
 $\beta^2 \approx \alpha\text{-(linker)}_m\text{-}\beta^1$  (1); or  
 $\beta^1\text{-(linker)}_m\text{-}\alpha \approx \beta^2$  (2)  
wherein each of  $\beta^1$  and  $\beta^2$  has the amino acid sequence of the  $\beta$  subunit of a vertebrate  
glycoprotein hormone, or a variant thereof;  
“ $\alpha$ ” has the amino acid sequence of the  $\alpha$  subunit of a vertebrate glycoprotein hormone or  
a variant thereof;  
“linker” is a linker moiety; and  
“ $\approx$ ” is a noncovalent link between  $\alpha$  and  $\beta^2$ ;  
m is 0 or 1;  
wherein each of  $\beta^1$  and  $\beta^2$  confer a different activity on said composition; and  
with the proviso that if  $\beta^1$  is CG $\beta$  then  $\beta^2$  is not FSH $\beta$ .

12. (Amended) A pharmaceutical composition which regulates the glycoprotein hormone concentrations in a mammal which comprises an effective amount of the composition of the formula

$$\beta^2 \approx \alpha\text{-(linker)}_m\text{-}\beta^1 \quad (1); \text{ or}$$

$$\beta^1\text{-(linker)}_m\text{-}\alpha \approx \beta^2 \quad (2)$$

in admixture with at least one pharmaceutically acceptable excipient; and

wherein each of  $\beta^1$  and  $\beta^2$  has the amino acid sequence of the  $\beta$  subunit of a vertebrate glycoprotein hormone, or a variant thereof;

" $\alpha$ " has the amino acid sequence of the  $\alpha$  subunit of a vertebrate glycoprotein hormone or a variant thereof;

"linker" is a linker moiety; and

" $\approx$ " is a noncovalent link between  $\alpha$  and  $\beta^2$ ;

each of m and n is independently 0 or 1;

wherein each of  $\beta^1$  and  $\beta^2$  confer a different activity on said composition; and

with the proviso that if  $\beta^1$  is CG $\beta$  then  $\beta^2$  is not FSH $\beta$ .

Please add the following claims:

21. (New) The composition of claim 11, wherein  $\beta^1$  is FSH $\beta$  or a variant thereof and  $\beta^2$  as FSH $\beta$  or a variant thereof.

22. (New) The composition of claim 11, wherein  $\beta^1$  is LH $\beta$  or a variant thereof and  $\beta^2$  as LH $\beta$  or a variant thereof.

23. (New) The composition of claim 11, wherein  $\beta^1$  is TSH $\beta$  or a variant thereof and  $\beta^2$  as TSH $\beta$  or a variant thereof.

24. (New) The composition of claim 11, wherein  $\beta^1$  is CG $\beta$  or a variant thereof and  $\beta^2$  as CG $\beta$  or a variant thereof.

25. (New) The composition of claim 11, wherein one of  $\beta^1$  and  $\beta^2$  is FSH $\beta$  and the other is LH $\beta$ .

26. (New) The composition of claim 11, wherein one of  $\beta^1$  and  $\beta^2$  is FSH $\beta$  and the other is TSH $\beta$ .

BY  
Cont 27. (New) The composition of claim 11, wherein one of  $\beta^1$  and  $\beta^2$  is LH $\beta$  and the other is TSH $\beta$ .

28. (New) The composition of claim 11, wherein one of  $\beta^1$  and  $\beta^2$  is LH $\beta$  and the other is CG $\beta$ .